SERVICE MANUAL

20R Carton Clamp

Manual includes:
Operation
Installation
Service
Troubleshooting

Manual Number 6043694

cascade® corporation

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Introduction

1.1 Premise

This manual contains instructions and warnings and **must** be kept with the product, as it represents one of the device's fundamental safety requisites.

The manual should be kept carefully and should be diffused and made available to all interested parties.

Warnings are aimed at safeguarding the safety of those exposed to the product against residual risks.

The instructions herein provide indications on the most suitable behaviour to be adopted for the correct use of the APPLIANCES CLAMP as intended by the manufacturer.

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1.1.1 TYPOGRAPHICAL CONVENTIONS

This user manual uses the following typographical conventions:

	Symbol	*Meaning*
NOTE		The notes contain important information outside the main text and should be read carefully.
CAUTION		Caution messages contain the procedures described in the manual that must be observed, non-compliance may cause damage to the device.
ATTENTION		Attention messages indicate the particular procedures that must be observed to avoid harm to the operator.

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2.1 Product purpose

2.1.1 Manufacturer's intended use

The horizontal camping device for appliances has been designed and manufactured to consent the handling of loads that are not pallet-mounted. The arms have rubber contact pads and the dimensions of the gripping arms vary according to the type of load to be handled.

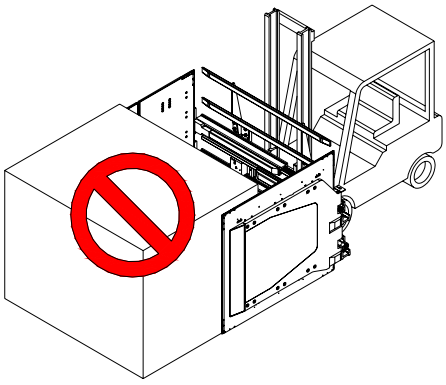
The purpose of horizontal gripping devices is to grip, handle, unload and stock boxed material.

Such devices may feature incorporated or semi-incorporated side shift for lateral load regulation.

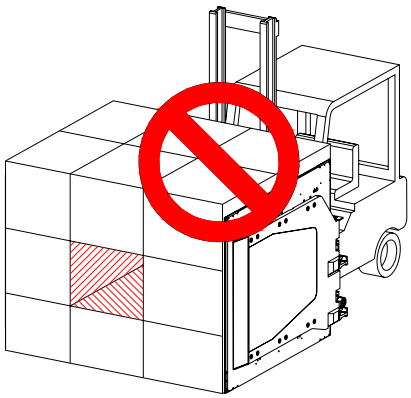
2.1.2 Improper and forbidden use

Horizontal gripping devices must not be used in the following ways:

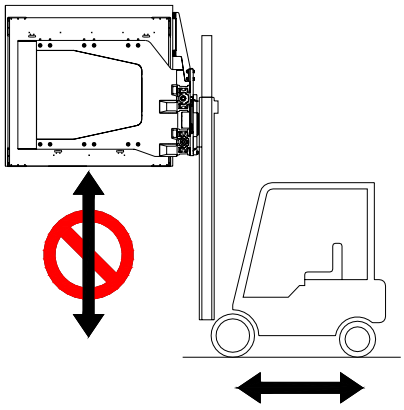
- to manoeuvre loads sideways with the outside of the arms using the open/close or shift functions;
- to drag or push loads on the floor or stocked loads;
- to manoeuvre bodies with cylindrical surfaces;
- to manoeuvre people or animals;
- to manoeuvre bodies gripped by the tip of the arm only;



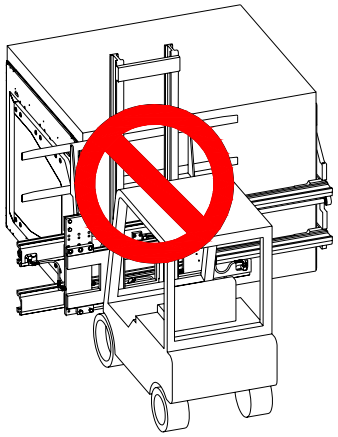
- manoeuvring loads when people or animals are present in the device's work area;
- manoeuvring unstable loads;
- manoeuvring groups of different sized cartons at the same time;
- to manoeuvre groups of cartons with missing cartons

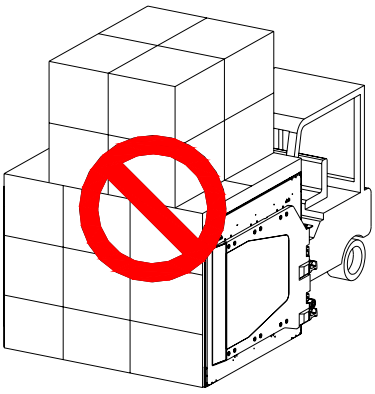


- repeated use of the lifting lever on the control panel when the load gripped between the arms is in contact with a horizontal surface;
- lifting or lowering the load when in movement. One operation only may be performed at any one time;



- Manoeuvring the truck when the load is not in line with the forklift truck's centre line;





- Calibrating the device's relief valve to a pressure value grater than that indicated on the device's ID plate.

2.2 Machine identification

2.2.1 ID plate

The ID plate is the only means of identifying the horizontal gripping device recognised by the Manufacturer.

The ID plate must be legible at all times and must not be tampered with.

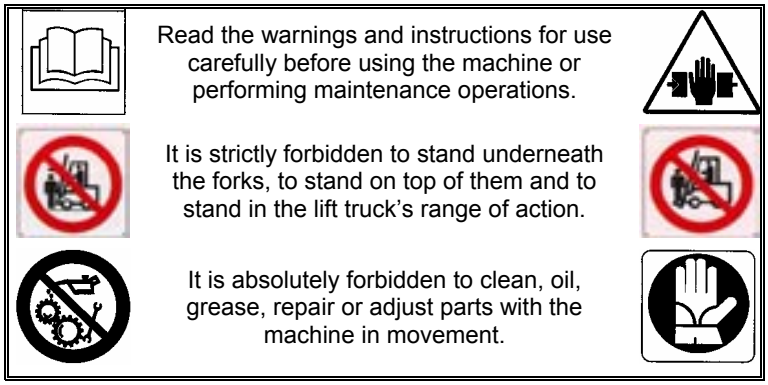
- ☞ THE SAFETY INDICATIONS INCLUDED IN THIS MANUAL AND ON THE MACHINE ITSELF MUST BE OBSERVED. DO NOT TAMPER WITH SAFETY DEVICES AND USE THE MACHINE AS INTENDED BY THE MANUFACTURER.
- ☞ *NON-COMPLIANCE TO SAFETY INDICATIONS MAY CAUSE HAZARD RISKS TO YOU AND TO OTHERS.*
- ☞ THESE INSTRUCTIONS AND WARNINGS ARE NOT INTENDED AS A SUBSTITUTE FOR SAFETY STANDARDS CURRENTLY IN FORCE, BUT RATHER AS AN INTEGRATION OF THEM AIMED AT ENCOURAGING COMPLIANCE.
- ☞ *We recommend that maintenance programmes be followed according to the indications given in this manual.*
- ☞ *Attention: warnings alone do not eliminate hazards!*
- ☞ *The indications included in this manual do not refer to new machines only, but also apply to used ones.*
- ☞ *The device may prove overloaded when driven on uneven ground or when driven very fast on smooth and slippery floorings.*
- ☞ *Passageways must permit good visibility and easy truck steering; steep ramps, narrow passageways and low ceilings should be avoided. Passageways must be clearly delimited, defined and kept in good conditions in order to avoid damage to the truck, device and load and to avoid instability.*
- ☞ *Work areas must be well lit.*
- ☞ *Do not introduce hands, arms or any other part of the body near moving organs.*
- ☞ *Do not transport or lift people.*
- ☞ *It is strictly forbidden to stand under to pass beneath the raised part of the truck (device), irrespective of whether it is loaded or not.*
- ☞ *Do not transport unstable loads.*
- ☞ *It is forbidden to handle loads exceeding the nominal capacity of the truck plus device.*
- ☞ *Restrict load side shift and truck manoeuvres with the upright partially or totally raised.*
- ☞ *Stable and well-distributed loads only may be manoeuvred.*
- ☞ *Particular attention must be paid when manoeuvring a truck bearing loads that cannot be positioned centrally.*
- ☞ *The load must be grasped by entire arm: the load should rest on the load backrest of the frame and on the protection devices on the sliding rail*
- ☞ *When the truck is moving with the device but without a load, keep the arms in the least open position possible, or however in a position that is globally narrower than the device's frame.*
- ☞ *It is forbidden to stop or turn the truck on ramps.*
- ☞ *When a truck is left unattended, gripping organs must be completely lowered, controls must be in the 0 position, the electricity supply must be switched off, the park brake must be used and all measures required for preventing accidental or unauthorised manoeuvre of the truck and the device must be adopted.*
- ☞ *Unauthorised operators must not eliminate any function errors or defects of the horizontal gripping device and/or alter function and operative modes.*
  .
- ☞ *All safety devices installed on forklift trucks such as:*
  - *the anti-shearing net or plate fixed to the load lifting uprights;*
  - *the protective canopy over the driver's seat*
  - *devices that prevent load descent in the event of a lack of driving force;*
  - *devices fitted with protections against accidental operation;*

  must always be kept in perfect and constantly efficient conditions, even during the installation of horizontal gripping devices.
  Indication, advice and hazard plates must be well kept and in place.
- ☞ *When investigating any cause of error or malfunction of the horizontal gripping device, adopt the precautions described in the manual that are suitable for preventing damage to people and objects.*
- ☞ *Remember to tighten each screw, bolt or ring nut for each mechanical element adjusted or regulated.*

ATTENTION: any alterations made to the horizontal gripping device will result in the expiry of the EC mark and the product guarantee.

3.1 Safety plates and pictograms

The horizontal gripping device is fitted with the pictogram shown below, which bears the main safety warnings and precautions that should be observed for machine use.


Read the warnings and instructions for use carefully before using the machine or performing maintenance operations.
It is strictly forbidden to stand underneath the forks, to stand on top of them and to stand in the lift truck's range of action.
It is absolutely forbidden to clean, oil, grease, repair or adjust parts with the machine in movement.

3.2 Residual hazards

- Hazard of crushing between the truck's front structure and that of the lifting set when completely tilted backwards.
- Hazard of shearing between the truck's front structure and that of the parts that move vertically with the lifting set completely tilted backwards.
- Hazard of shearing between the fixed frame and the device's moving arms.
- Hazard of crushing between:
  - The chains and the relative pulleys and the transversal connections of the uprights themselves.
  - Between the fixed frame and the device's moving arms.
- Hazard of crushing during arm dismantling and replacement phases.
- Hazard of crushing during cylinder dismantling and replacement phases.
- Hazard of crushing during installation and maintenance operations.

4.1 Description of manoeuvres

ATTENTION: all lifting operations must be performed by qualified and authorised personnel only.

- The number shown in brackets refer to the "Set maps".

4.2 Important recommendations for correct device installation

4.2.1 Preliminary information

In order for the device to function correctly, connections to the truck's hydraulic system must be performed perfectly. In order to facilitate this task, a list of information that will help correct installation is given below.

It should be pointed out that **back pressure** in closure, which is shown on the tube opposite that under pressure, **must not exceed 20 bar**. Back pressure exceeding this limit will jeopardise device performance. In the event of malfunctions, the first check to make is that of the back pressure.

Roncari recommends that the following hydraulic capacities and working pressures be observed in order to optimise device functioning and to avoid problems during operation or start-up. The values shown below are to be considered a rough guide and can vary from one device to another.

Class of hook ISO 2328	Nominal truck capacity (Kg)	Load's centre of gravity	Recommended hydraulic capacity (l/min)			Recommended working pressure (BAR)
			Min	Med	Max	Max
1	Up to 999	400	10	15	25	150 *
2	from 1000 to 2500	500	15	30	50	150 *
3	from 2501 to 4999	500	20	40	60	150 *
4	from 5000 to 8000	600	45	60	80	150 *
5	from 8000 to 10999	600	60	80	100	150 *

* Pressure values valid unless shown otherwise on the device's plate (and EC certificate).

4.2.2 Scaling the hydraulic system

In addition to the pressure and hydraulic capacity values sent by the truck, correct device functioning depends on the type of supply system used between the truck distributor and the device. The fundamental parameters that influence device behaviour are the diameter and length of the tubing, for example, tubes with a diameter that is too small compared to the relative length and to a given capacity can cause excessive load losses that jeopardise the correct functioning of the truck-device system.

The connection hoses are scaled according to the capacity actually supplied by the truck to activate the device and the length of the relative tubing.

The difficulty of creating a perfect hydraulic system in other words, one that complies with the laws of hydraulics, is obvious, as it would provide tubing of an excessive diameter and a very bulky system that would be very difficult to obtain. The next paragraph contains a table with the absorption values for the various tube dimensions, lengths and hydraulic capacities. This table may help the operator who prepares the system that links the truck to the device to install a system that has the correct dimensions and is optimal for system functioning, in other words, one that is capable of **obtaining back pressures of approximately 20 bar**.

Pressure losses of tubes with hydraulic oil with a viscosity of 20 cSt at regime temperature (system warm) and of 100 cSt during start-up from cold. The assumption of viscosity is obviously arbitrary, but similar to real conditions.

The table below gives the pressure loss values (Bar) per linear meter of tube.

1/4 G - 6,4 mm approx.								
	Oil viscosity 20 Cts				Oil viscosity 100 Cts			
litres/1'	**L=1 m**	**L= 5 m**	**L=10 m**	**L=20 m**	**L=1 m**	**L= 5 m**	**L=10 m**	**L=20 m**
10	0.85	4.2	8.5	16.9	3.3	16.5	33.0	66.0
15	1.72	8.6	17.2	34.4	5.0	24.8	49.5	99.1
20	2.9	14.3	28.5	57.0	6.6	33.0	66.0	132.0
30	5.8	29.0	58.0	116.0	9.9	49.5	99.0	198.0
40	9.6	48.0	96.0	192.0	14.3	71.5	143.0	286.0
50	14.2	71.0	142.0	284.0	21.2	106.0	212.0	424.0
60	19.5	97.5	195.0	390.0	29.1	145.5	291.0	582.0

5/16 G - 8,0 mm approx.								
	Oil viscosity 20 Cts				Oil viscosity 100 Cts			
	L=1 m	**L= 5 m**	**L=10 m**	**L=20 m**	**L=1 m**	**L= 5 m**	**L=10 m**	**L=20 m**
10	0.29	1.5	2.9	5.9	1.4	6.8	13.5	27.0
15	0.60	3.0	6.0	11.9	2.0	10.1	20.3	40.6
20	1.0	5.0	9.9	19.8	2.7	13.5	27.0	54.0
30	2.0	10.0	20.0	40.0	4.1	20.3	40.6	81.2
40	3.3	16.6	33.2	66.4	5.4	27.0	54.0	108.0
50	4.9	24.6	49.1	98.2	7.3	36.7	73.4	146.8
60	6.8	33.8	67.5	135.0	10.1	50.5	101.0	202.0
70	8.9	44.3	88.5	177.0	13.2	66.1	132.2	264.4

3/8 G - 9,5 mm approx.								
	Oil viscosity 20 Cts				Oil viscosity 100 Cts			
	L=1 m	**L= 5 m**	**L=10 m**	**L=20 m**	**L=1 m**	**L= 5 m**	**L=10 m**	**L=20 m**
20	0.4	2.2	4.4	8.8	1.4	6.8	13.6	27.2
30	0.9	4.5	8.9	17.8	2.1	10.3	20.5	41.0
40	1.5	7.4	14.7	29.4	2.7	13.6	27.2	54.4
50	2.2	10.9	21.7	43.4	3.4	17.0	34.0	68.0
60	3.0	15.0	29.9	59.8	4.5	22.3	44.6	89.2
70	3.9	19.6	39.1	78.2	5.9	29.3	58.5	117.0
80	4.9	24.7	49.4	98.8	7.4	36.9	73.8	147.6
90	6.1	30.5	61.0	122.0	9.1	45.5	91.0	182.0
100	7.3	36.5	73.0	146.0	10.9	54.5	109.0	218.0

1/2 G - 12,7 mm approx.								
	Oil viscosity 20 Cts				Oil viscosity 100 Cts			
	L=1 m	**L= 5 m**	**L=10 m**	**L=20 m**	**L=1 m**	**L= 5 m**	**L=10 m**	**L=20 m**
30	0.2	1.1	2.2	4.5	0.6	3.2	6.4	12.8
40	0.4	1.9	3.7	7.4	0.9	4.3	8.5	17.0
50	0.6	2.8	5.5	11.0	1.1	5.3	10.7	21.3
60	0.8	3.8	7.5	15.0	1.3	6.4	12.8	25.6
70	1.0	5.0	9.9	19.8	1.5	7.5	14.9	29.8
80	1.3	6.3	12.5	25.0	1.9	9.3	18.6	37.2
90	1.5	7.7	15.3	30.6	2.3	11.5	22.9	45.8
100	1.8	9.2	18.4	36.8	2.8	13.8	27.5	55.0

WARNING: Rated capacity of the truck/ attachment combination is a responsibility of the original truck manufacturer and may be less than that shown on the attachment nameplate. Consult the truck nameplate.

Truck Relief Setting

2300 psi (160 bar) Recommended
2600 psi (180 bar) Maximum

Truck Flow Volume ①

	Min. ②	Recommended	Max. ③
20R	5 GPM (19 L/min.)	7.5 GPM (28 L/min.)	10 GPM (38 L/min.)

① Cascade Carton Clamps are compatible with SAE 10W petroleum base hydraulic fluid meeting Mil. Spec. MIL-0-5606 or MIL-0-2104B. Use of synthetic or aqueous base hydraulic fluid is not recommended. If fire resistant hydraulic fluid is required, special seals must be used. Contact Cascade.

② Flow less than recommended will result in reduced system performance.

③ Flow greater than maximum can result in excessive heating, reduced system performance and reduced hydraulic system life.

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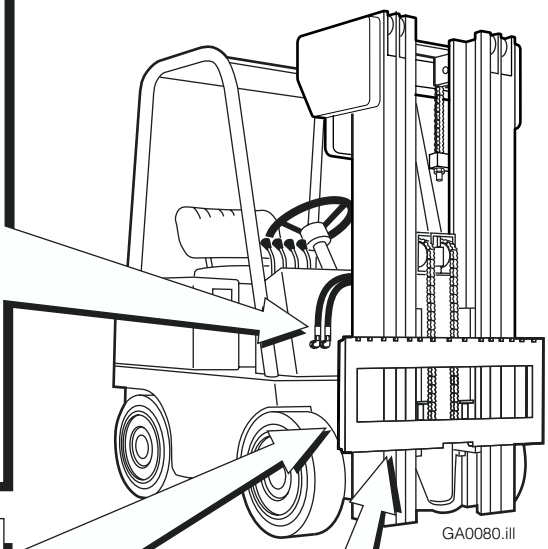
Carriage Mount Dimension (A) ITA (ISO)

	Minimum	Maximum
Class II	14.96 in. (380.0 mm)	15.00 in. (381.0 mm)
Class III	18.68 in. (474.5 mm)	18.74 in. (476.0 mm)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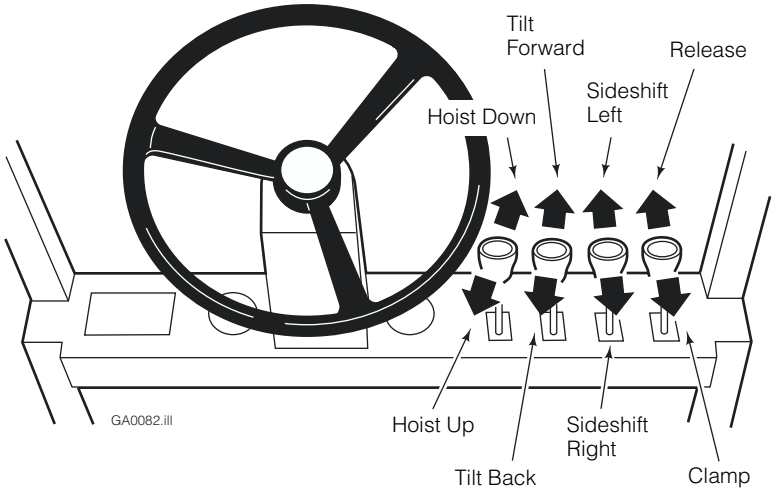
Carriage

Clean carriage bars and inspect for damaged notches

Auxiliary Valve Functions

Check for compliance with ITA (ISO) standards:



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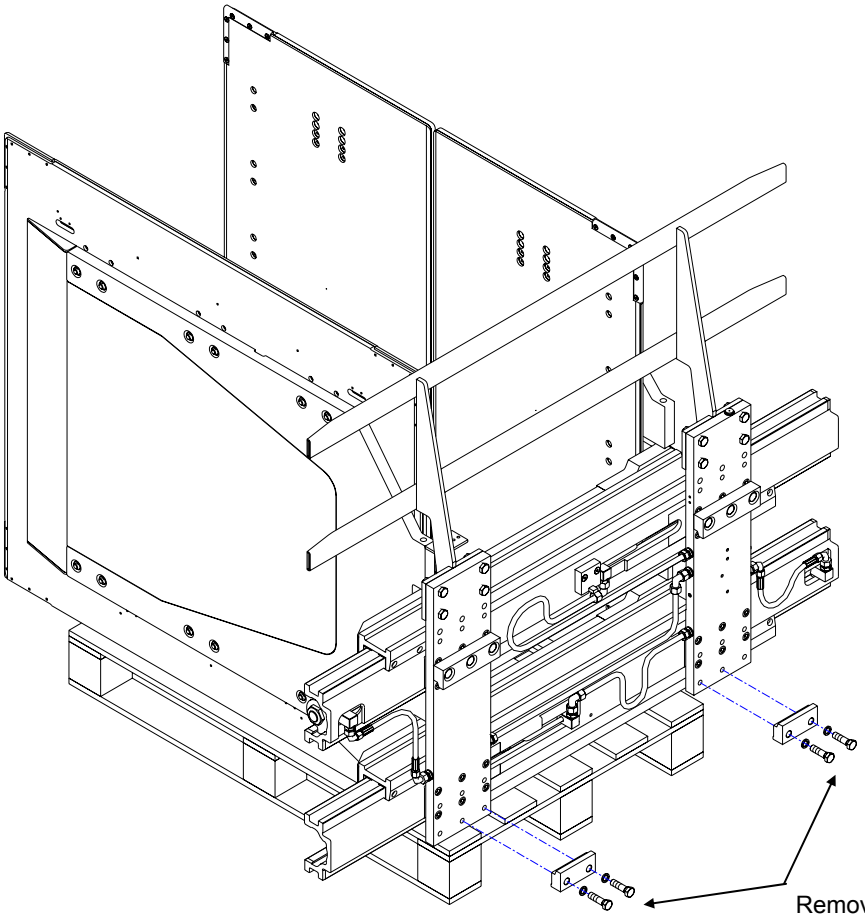
Before proceeding with device installation it is necessary:

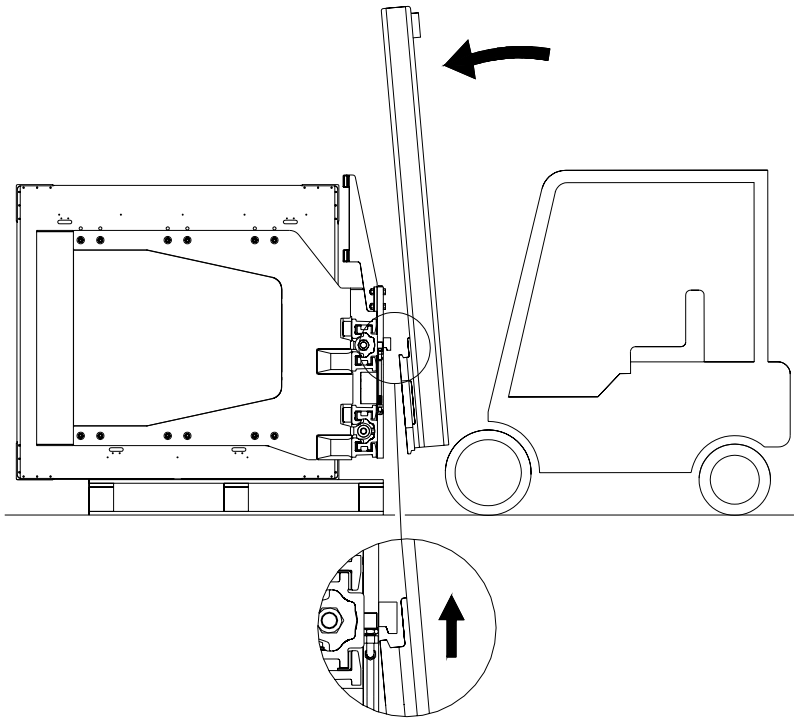
- to remove wrapping
- to remove the device's lower brackets



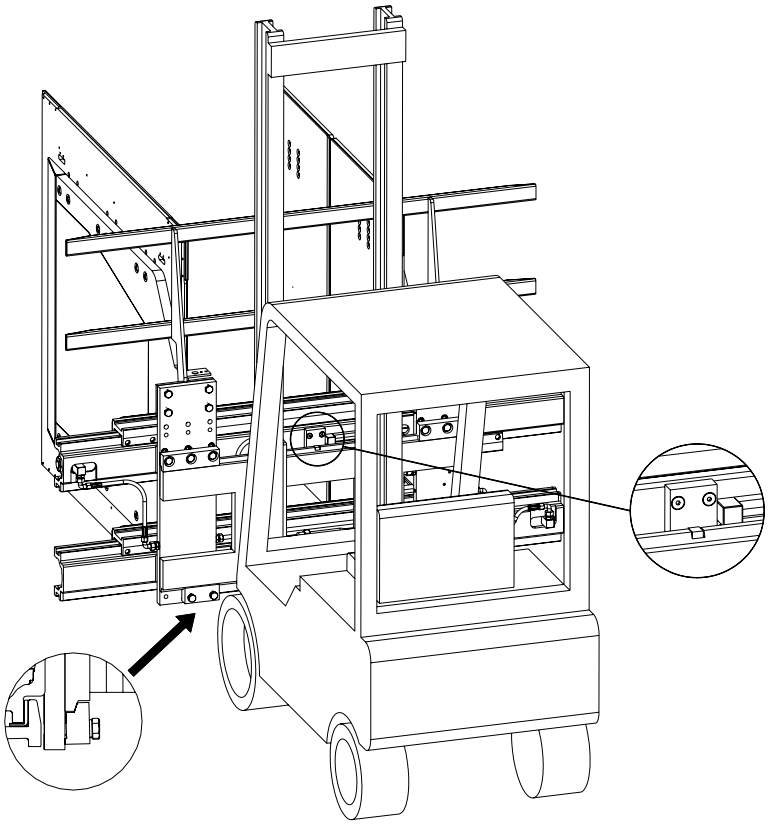
Remove the screws clamping the lower brackets (n°14).

ATTENTION: all loading and manoeuvring operations made using the truck must be performed central to the centre of gravity on the fork, compared to its dimension and weight distribution.

2 **Assemble the device on the forklift truck's plate by handling it with the tilting of the upright in order that the fork holder plate's upper cone hooks up with the device (see detailed figure).**



3 **Line up the device's central retainer (8) with the central niche of the forkholder plate.**



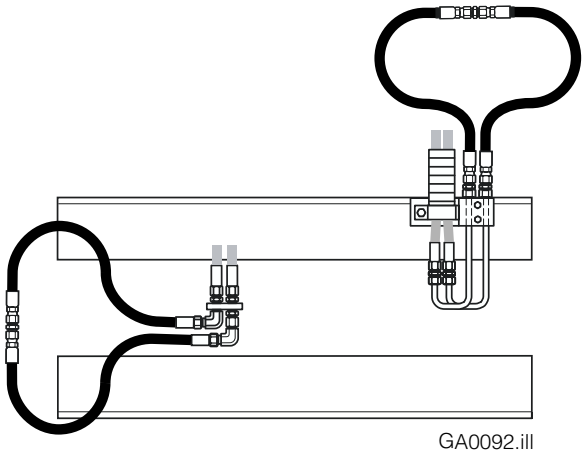
Reposition the lower brackets (n°14) and tighten the screws with the torque wrench setting as shown in point 5.6.

4 Flush hydraulic supply hoses

A Install hoses using union fittings.

B Operate auxiliary valves for 30 sec.

C Remove union fittings.



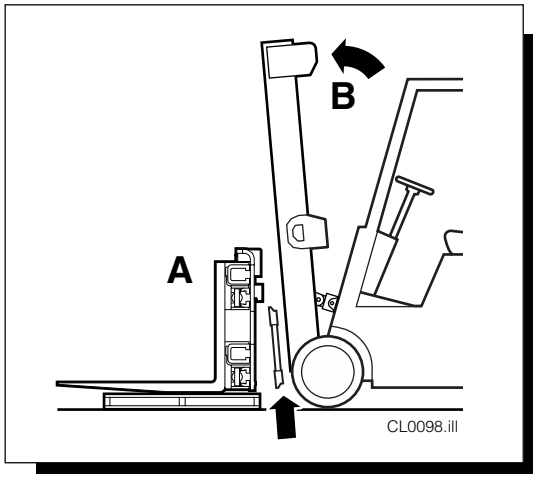
5 Mount clamp on truck carriage

A Center truck behind clamp.

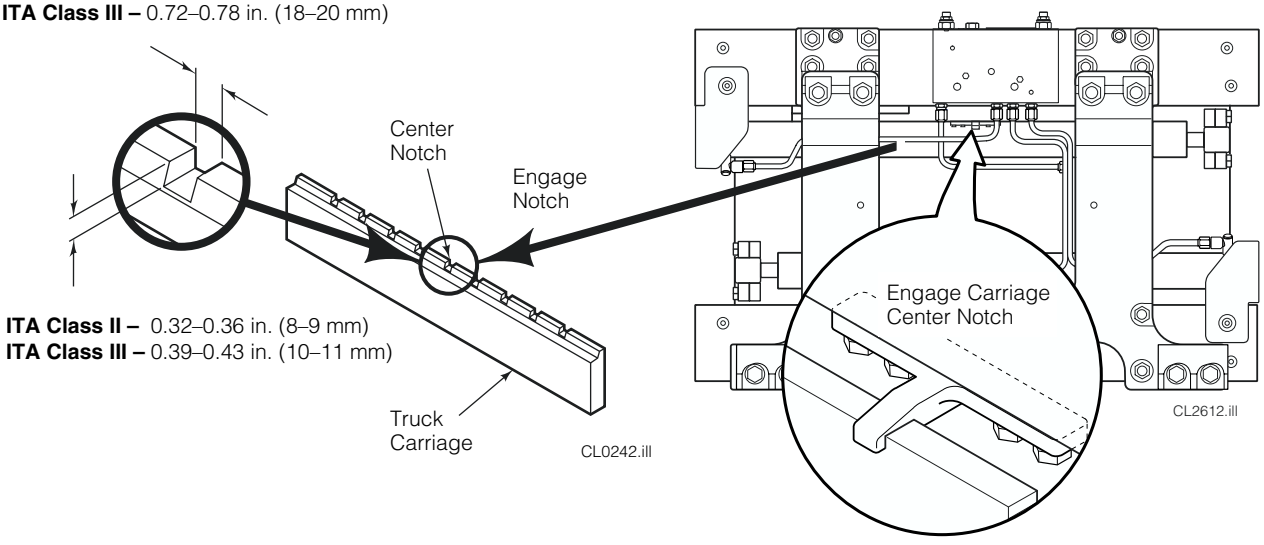
B Tilt forward and raise carriage into position.

C Engage upper mounting hooks with top carriage bar. Make sure centering tab engages the center notch on the carriage bar.

D Lift the clamp 2 in. (5 cm) off pallet.



ITA Class II – 0.60–0.66 in. (15–17 mm)
ITA Class III – 0.72–0.78 in. (18–20 mm)



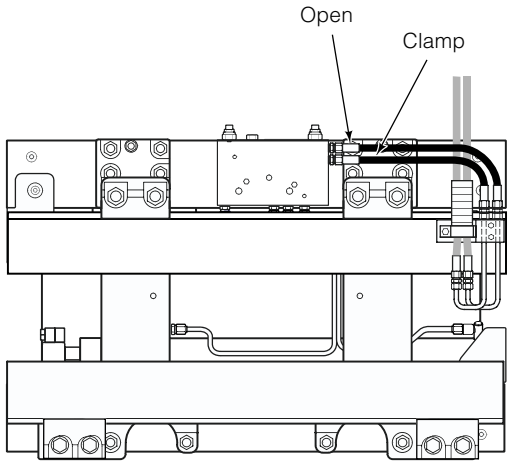
ITA Class II – 0.32–0.36 in. (8–9 mm)
ITA Class III – 0.39–0.43 in. (10–11 mm)

6 Prepare Hoses

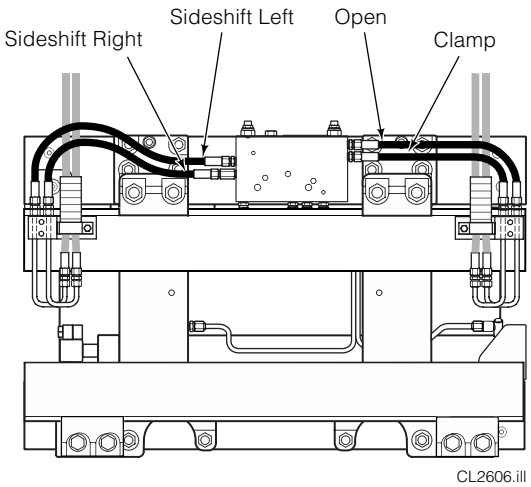
A Determine hose lengths required for hydraulic supply configuration of truck.

B Cut hoses to length, install end fittings.

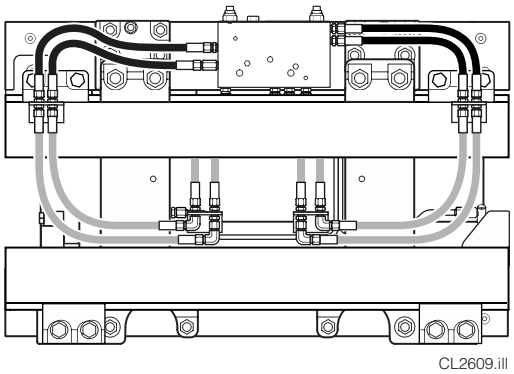
IMPORTANT: Valve options include LH or RH CLAMP/OPEN porting which allows hoses to be plumbed to match existing truck hydraulic supply configurations.



Non-Sideshifting – Single Hose Reel

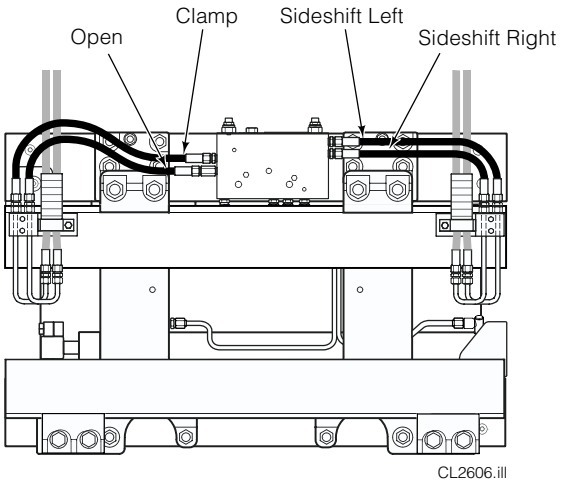


Sideshifting – Double Hose Reels

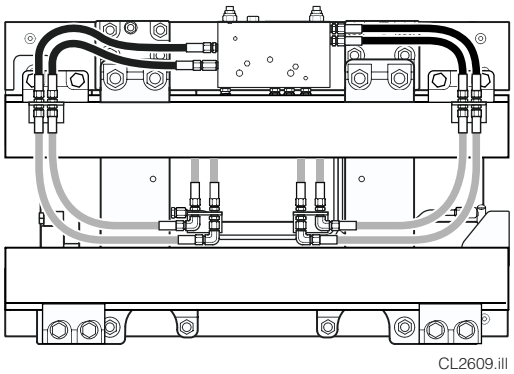


Sideshifting – Double Internal Hose Reeving

Clamps with Reverse Hydraulics – Clamp LH and Sideshift RH



Sideshifting – Double Hose Reels



Sideshifting – Double Internal Hose Reeving

7 Adjust relief cartridges

For over-pressure protection, the relief valve cartridges for both the CLAMP and SIDESHIFT functions should be adjusted to match truck hydraulic pressure.

WARNING: Before removing hydraulic lines or components, relieve pressure in the hydraulic system. Turn the truck off and open the truck auxiliary control valves several times in both directions.

Clamp Relief Adjustment

A Confirm that the truck pressure is a maximum of 2600 psi (180 bar) at the carriage hose terminal.

B Install a 3000 psi (200 bar) pressure gauge to the valve TEST port (No. 4 O-ring fitting required).

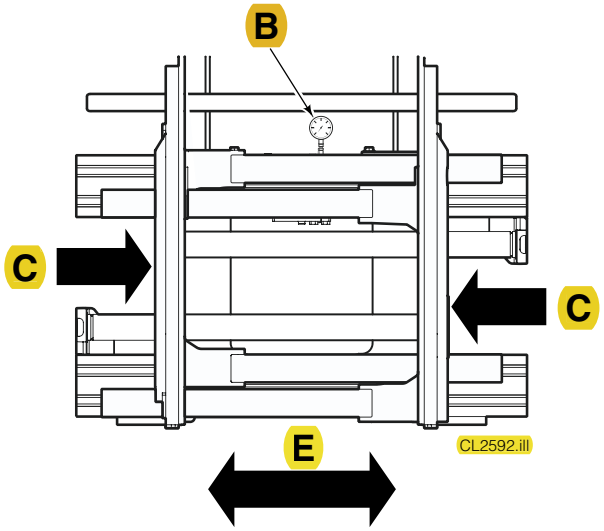
C Cycle the arms to full open. Slowly close arms while clamping a maximum rigid load (or clamp force indicator). Hold lever in the **CLAMP** position and accelerate the engine to develop full pressure.

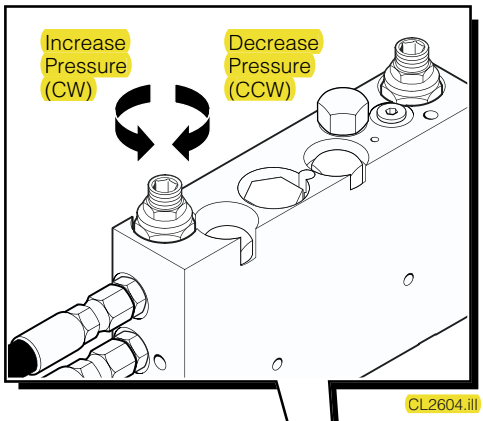
D Adjust the valve **CLAMP** relief cartridge to show a maximum setting of 2600 psi (180 bar) on the gauge. Turn clockwise to increase pressure, counterclockwise to decrease pressure. Tighten the jam nut.

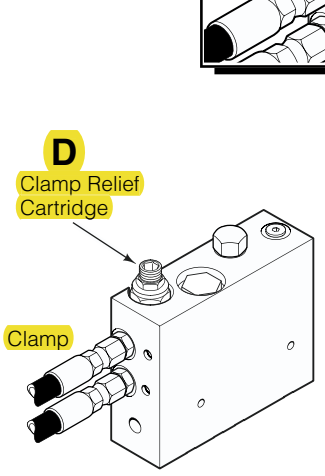
Sideshift Relief Adjustment

E While clamping a load, sideshift fully to the left or right and note the gauge reading at the end of the sideshift stroke.

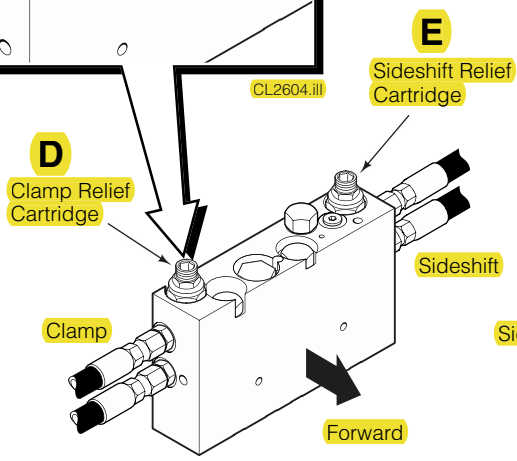
F Adjust the **SIDESHIFT** relief cartridge to set the pressure at the end of the sideshift stroke to **less than the clamp relief setting** adjusted in step D. Adjust the cartridge clockwise to increase pressure or counterclockwise to decrease. Tighten the jam nut.



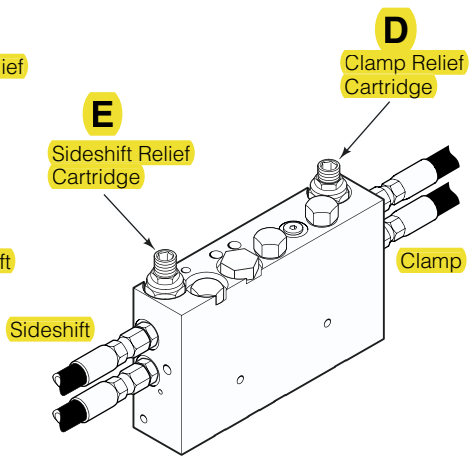




NON-SIDESHIFT VALVE RH CLAMP



SIDESHIFTING VALVE RH CLAMP



SIDESHIFTING VALVE LH CLAMP

4.2.3 Regulation and calibration working pressure

The regulation of device working pressure is performed by Cascade's Factory Testing Division.
A copy of the factory Test for this device is annexed.

Device code	**20R**
Serial No.	

Testing conditions	
Test bench	BNC03
Oil flow (l/min)	50
Pump max pressure (bar)	210
Oil temperature (°C)	40

Force and pressure diagram in varius conditions		
Clamping force (daN)	**Pressure (bar)**	**Counter-pressure (bar)**
290	80	10
769	100	10
1120	120	10
1574	130	10
1884	150	10

Pressure regulation		
Clamping force (daN)	**Pressure (bar)**	**Counter-pressure (bar)**
1120	120	10

5.1 Precautions

ATTENTION: careful maintenance is essential for good device functioning.
Failure to perform maintenance as and when foreseen may cause danger to people and objects.

It is the user's responsibility to choose the device and ropes, bands or chains deemed most suitable, with regards to both functionality and capacity, for UEC handling and lifting.
We recommend that all manoeuvring and lifting operations be performed with the utmost caution, in order to avoid collisions that may jeopardise good functioning or cause damage to components or personnel. .

5.2 Unauthorised alterations

It is strictly forbidden:

- To use the positioner without any one of the components of which it is composed.
- To weld, install or add any optional accessory not foreseen by Roncari.
- To remove material..

ATTENTION: any alteration or modification made to the UEC that has not been authorised by Cascade in writing, will cause the invalidation of the EC mark and product guarantee.

5.3 Cleaning

Do not wash the UEC using jets of water at high pressure.
After each wash, all the parts must be greased once more.

5.4 Check on rod and tubing

Every day, check that the rod and the surface are free from damage, marks or any other fault that could jeopardise correct cylinder functioning.

Check the condition of the tubing and joints according to the hydraulic system's technical data and features.

5.5 Routine maintenance

Hours	Description
100	– Check that the camping screws on the upper and lower brackets are tightened properly. – Check any damage to the hydraulic system's tubes or joints. – Check arm synchronism in opening and closure.
500	In addition to the abovementioned checks: – Grease arm sliders as indicated in the following paragraph. – Check the arm's gripping surface for wear – Check that the arm opening and closing cylinders are tightened correctly.
1000	In addition to the abovementioned checks: – check that the clamping screws of the sliding rails are tightened properly.
2000	In addition to the abovementioned checks: – replace the upper and lower sliders.

5.6 Bolt torque wrench setting

Rh pitch (mm)			**Sr** (mm²)	**8.8**	**10.9**	**12.9**
				M (N*m)	**M** (N*m)	**M** (N*m)
8	**x**	**1,25**	36,6	25	37	44
10	**x**	**1,5**	58	50	73	86
12	**x**	**1,75**	84,3	86	127	148

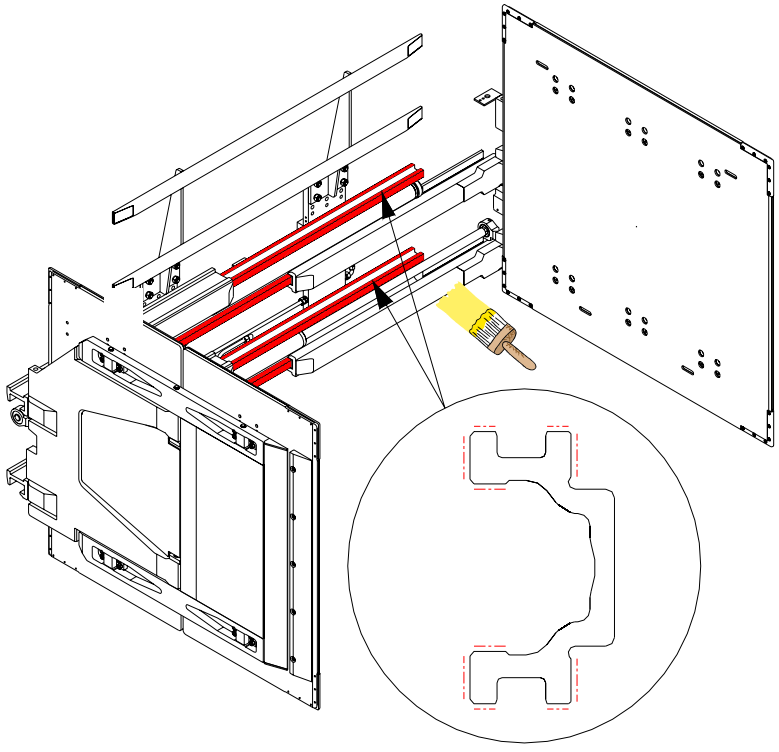
5.7 Sliders

5.7.1 Greasing

Greasing the sliders is a routine operation that must be performed in order to guarantee correct lubrication and therefore safe and easy usage of the Horizontal Gripping Device.

The guides are pre-lubricated in the production phase and therefore do not require lubrication when the device is installed for the first time.

ATTENTION: lubrication operations must only be performed with truck power off.

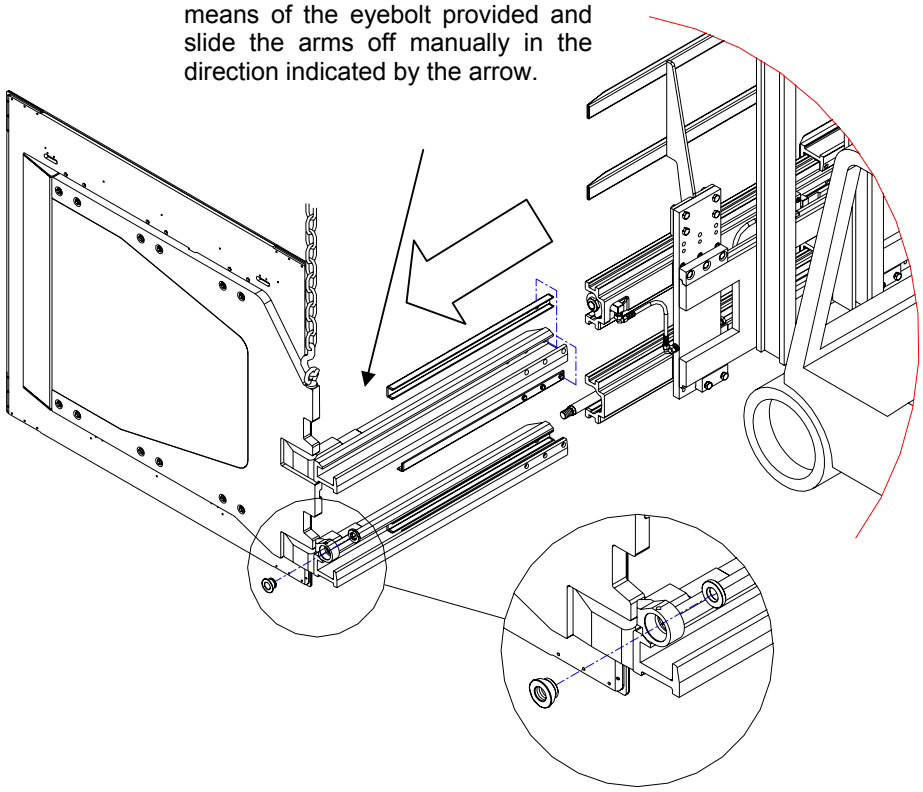


5.7.2 Replacing the sliders

In order to replace the sliders, dismantle the arms:

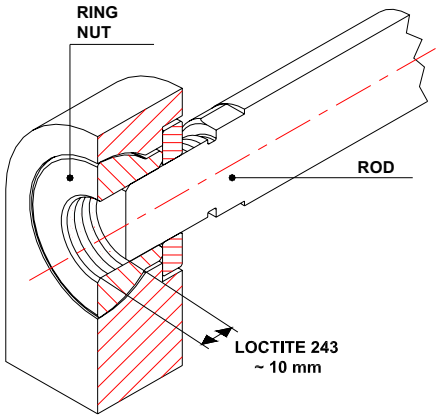
- Lower truck upright as far as possible.
- Open arms as wide as possible.
- Switch off truck power supply.
- Remove the semi-spherical joint and the washer that attaches it to the rod.

Fix the arms using a winch by means of the eyebolt provided and slide the arms off manually in the direction indicated by the arrow.



ATTENTION: the utmost attention must be paid when sliding the arms off the frame guides, because it could move and collide with the operator.

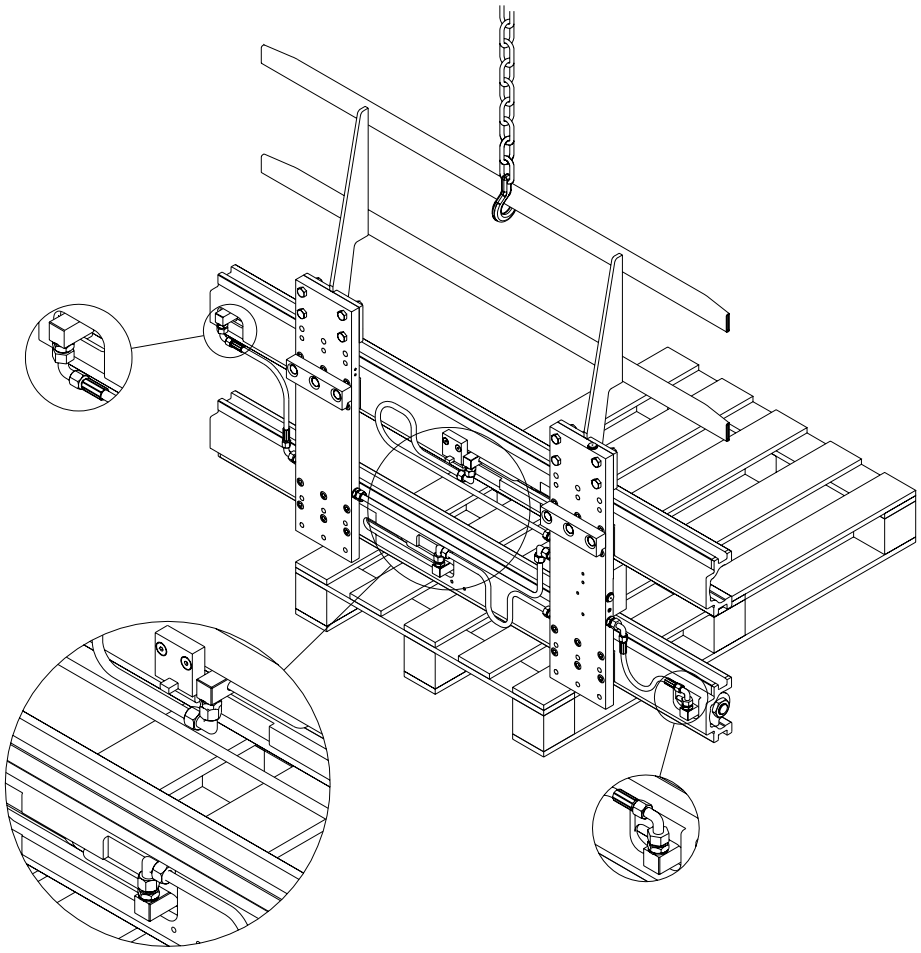
- Pull the cylinder rod off completely.
- Replace worn sliders with original Roncari spares.
- Clean and grease the internal surface of the sliders with a brush.
- Re-assemble the arms by performing the above mentioned steps in reverse order.
- Screw the rod partially on to the ring nut or joint.
- Apply a film (10mm of thread for rods with diameters less than 50mm, 20 mm for diameters from 50 to 80 mm and the entire thread for diameters greater than 80mm) of medium mechanical resistance thread-locking glue (e.g. loctite® 243) as shown in diagram.



- Fully tighten the rod
- Check that the device functions properly. First try using without a load and then with a load.
- Perform opening and closing cycles without load.
- Repeat the same operations for the other arm.

5.8 Replacing and dismantling the opening and closing cylinders

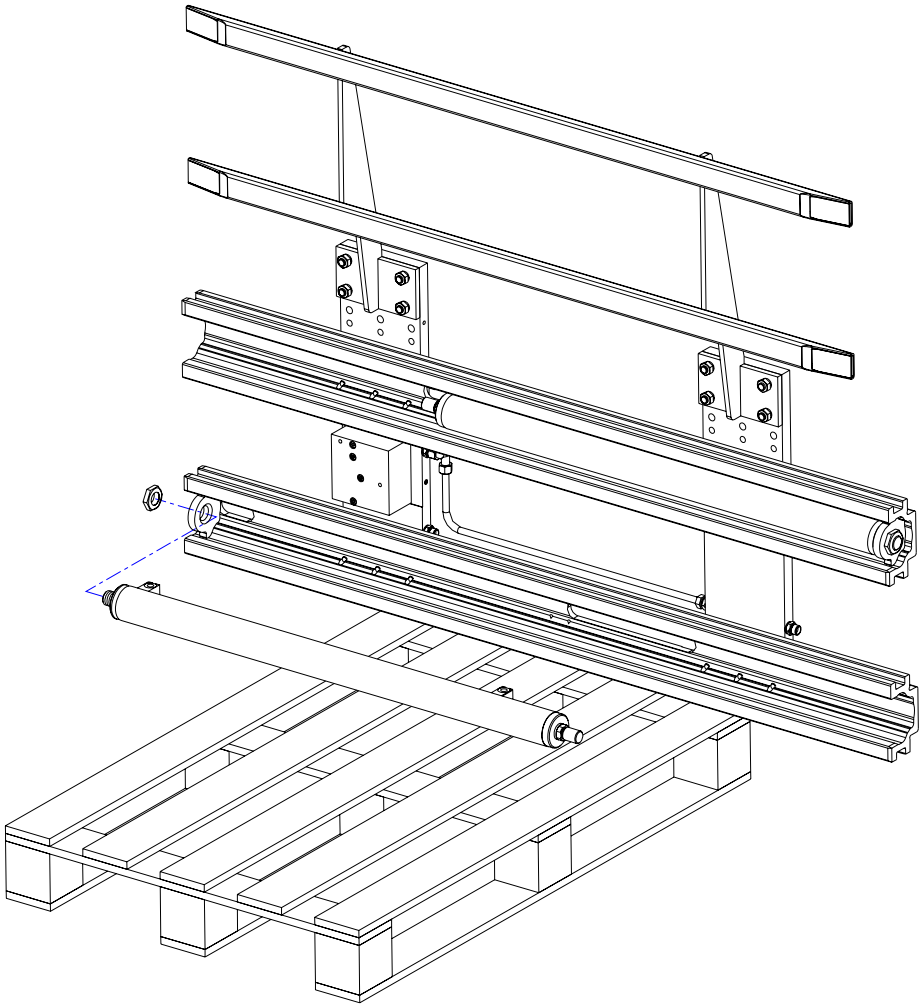
- Remove both arms as described above.
- Close the cylinders completely
- Disconnect the device's hydraulic system from that of the truck (paying careful attention to oil leaking from the tube, place a container below to catch it)
- Remove the device's lower brackets (n°14), hook the ropes up to the device's frame and dismantle the truck plate. For convenience, place a pallet below the device.
- Remove the hydraulic connections between the cylinder buds and the device's hydraulic system. Pay careful attention to oil leaks from the joints.



- Remove the cylinder blocking nut

ATTENTION: switch off truck power before commencing cylinder dismantling and reassembling operations. Pay careful attention to oil leaks from tubing and joints on cylinder. Place a container beneath to receive any leaks.

NOTE: before replacing the rod, check its condition to ensure that it is not damaged or scratched and that there are no impurities on its surface that could hinder perfect sliding of the parts and therefore the functioning of the UEC. Check that the inner surface of the cylinder jacket is clean.



- Slide the cylinders off the device's frame and replace with new cylinders as shown on the spares diagram (see point 2.3.1).
- If the cylinders require maintenance, replace the gaskets as described in the next paragraph.
- Replace the cylinders and fix the nut with medium mechanical resistance thread-locking glue (e.g. loctite® 243)
- Reassemble the hydraulic connections between the cylinder buds and the device's hydraulic system.
- Reassemble the device on the forkholder plate of the truck as described in 4.2.3.
- Replace the arms as described in 5.4.
- Reconnect the device's hydraulic connection to the truck and perform a few opening and closing cycles and side shift cycles (if present) without a load

5.8.1 Grease lubrication

The table below defines the products to be used to lubricate the various device components.

Type of coupling	Type of product to be used at room temperature
Sliding of arm sliders on sliding rail	SHELL SUPER GREASE AM or equivalent lithium based grease with an NLGI 2 consistency.

ATTENTION: different products may only be mixed if sure of absolute compatibility.

6.1 Work Cycle problems

PROBLEMS	CAUSE	SOLUTION
Clamp not synchronised	1.1 Truck capacity out of valve capacity range.	Measure the capacity of the forklift truck and if necessary make it be within the field of capacities foreseen for device functioning.
The clamp is not synchronised in opening and closing movements when empty.	2.1 The 1Lh and 1Rh regulators are not balanced.	Adjust one of the two regulators, never both. In order to avoid errors, always adjust 1Rh using the following criteria: The clamp's **Rh** arm is **faster** than the other. **Turn the 1Rh adjuster** a quarter of a turn and then try again. If it is still faster than the other turn a little more until perfect synchronisation is obtained. If a quarter of a turn slows it too much, turn 1Dx in the other direction until perfect synchronisation is obtained. The clamp's **Rh** arm is **slower** than the other: Unscrew the 1Dx adjuster a quarter of a turn and try again. If it is still slower than the other, unscrew a little more until perfectly synchronised. If a quarter of a turn speeds it up too much, screw 1Rh until perfect synchronisation is obtained.
	2.2 There is mechanical friction on the guides and/or of the cylinder of one of the two arms. The slower of the two arms is the one with problems.	Carefully lubricate guides. If the problem is not resolved, censure that there are no foreign bodies trapped in the guide of the slower arm. Excessive dirt may also cause problems and requires thorough cleaning and lubrication of the guides. If it depends on the cylinder grip, the clamp is not able to hold the load, and may also leak around the rod of the slower cylinder.

PROBLEMS	CAUSES	SOLUTION
The clamp does not move	3.1 Oil lacking	Top up the oil level using oil indicated by the forklift truck manufacturer.
	3.2 Oil from the truck distributor does not arrive.	Contact Truck manufacturer for Assistance.
	3.3 If there are quick connections for connection to the truck, one or more may be partially inserted.	Connect quick connections correctly.
	3.4 The quick connections would all appear to be properly connected, but the problem persists due to a faulty connection.	If possible, eliminate quick connections and replace with standard joints. If it is not possible to eliminate the quick connectors, replace that which would appear faulty (replace male and female). Repeat the operation until the problem is solved.
	3.5 Truck's system absorption is excessive and simultaneous calibration of distributor's max pressure valve too low.	Increase the calibration of the distributor's maximum pressure valve: the distributor's calibration pressure must be greater than absorption by the hydraulic system.
The clamp is slow in side shift. Other truck movements are regular and the clamp holds the load.	4.1 Needle valve position 2 is too open.	Tighten the needle valve position 2 a quarter of a turn and recover desired speed.
The Clamp is slow in opening and closing movements and grip is insufficient.	5.1 The relief valve position 4 is under-calibrated compared to requirements.	Tighten valve position 4 enough to hold the load. Calibrate checking the temperature using a full scale 250 bar pressure gauge introduced in the place of plug M. Careful attention should be paid not to tighten the valve beyond the calibration of the truck's general relief valve.
The clamp does not have sufficient force to hold the load.	6.1 Relief valve position 4 is calibrated too low.	Having introduced the pressure gauge in position M, release the relief valve. If it is calibrated too high, the truck's general relief valve will intervene.
	6.2 Overpressure valve position 4 has excessive blow-bys.	Dismantle the valve in order to clean thoroughly, removing any foreign bodies. Check that gaskets are intact. In case of doubt, replace gaskets.
	6.3 The pump or other truck components prevent the desired pressure being achieved.	Introduce a pressure gauge on the pump line and at the end of the run activate the lift to check the pressure that can be reached. If the pressure recorded is lower than that declared by the Manufacturer, call for assistance.
	6.4 If the previous check was satisfactory, there are no pressure losses due to equipment on the clamp control line	The seal of devices positioned between the clamp and the truck can be checked. In particular, check any capacity regulators on the line.

Troubleshooting

PROBLEMS	CAUSES	SOLUTION
The clamp does not have sufficient force to hold the load.	7.1 See point 3.5	See point 3.5
The clamp does not close, or closes slowly.	8.1 Relief valve position 4 has excessive blow-bys	Dismantle the valve in order to clean thoroughly, removing any foreign bodies. Check that gaskets are intact. In case of doubt, replace gaskets.
	8.2 Block valves 5Rh and/or 5Lh are dirty.	Dismantle the valve in order to clean thoroughly, removing any foreign bodies. Check that gaskets are intact. In case of doubt, replace gaskets.
The clamp does not open	9.1 Drained block valve position 7 is dirty and/or blocked.	Dismantle the valve in order to clean thoroughly, removing any foreign bodies. Check that gaskets are intact. In case of doubt, replace gaskets. Ensure that the piloting piston and the check valve slide.
	9.2 Check valve position 6 is dirty and/or blocked.	Dismantle the valve in order to clean thoroughly, removing any foreign bodies. Check that gaskets are intact. In case of doubt, replace gaskets. Check that the check valve slides.
After a certain interval the clamp does not hold the load.	10.1 Drained block valve position 7 and/or check valve position 6 are dirty and/or blocked.	Introduce a pressure gauge at M and check that with the load gripped and the control distributor in the centre, the drop in pressure is not higher than 5 bar every 3 minutes. If the drop in pressure is higher than this value, the lock valve must be dismantled and the check valve must be thoroughly cleaned in order to remove any foreign bodies. Check that the gaskets are intact and if in doubt replace them. Ensure that the piloting piston and the check valve slide.
The clamp loses the load when translating to the left or to the right.	11.1 One of the two cylinders that holds and side shifts the load gets to end of run before the other. By Insisting on the end of the side shift run, the other jack that has not come to end of run is over loaded and due to the section differences between the rod and the cylinder an movement is caused that results in clamp opening. It should be pointed out that this phenomenon is most frequent with closure pressures lower than 100 Bar.	Intervene on throttle position 2 unscrewing it until a compromise is obtained between the closure force and translation speed. If this does not resolve the problem, contact out Customer Assistance Service.

PROBLEMS		CAUSES	SOLUTIONS
Clamp use causes the oil to overheat.	12.1	Too frequent use of the clamp with pump with capacity higher than 60 dm^3/1'.	The 1Lh and 1Rh throttle are too closed. Open both half a turn at a time until the desired effect is obtained. If adjusting the throttle does not resolve the problem, it should be pointed out that the clamp is dimensioned for performing typical warehouse manoeuvres and therefore, if the truck is used as a manufacturing machine (for example as though it were a small digger), oil overheating is inevitable. If it is not possible to avoid using the truck as a manufacturing machine, the pump capacity should be reduced. Contact the Assistance Service of truck Manufacturer.

Do you have questions you need answered right now? Call your nearest Cascade Service Department.
Visit us online at www.cascorp.com

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